2020

Journey Through Science Club

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NEBRASKA HONORS PROGRAM
CLC EXPANDED LEARNING OPPORTUNITY CLUBS
INFORMATION SHEET

Name of Club: Journey Through Science

Age/Grade Level: 1-3

Number of Attendees: 10-12

Goal of the Club: (learning objectives/outcomes)

To educate students on scientific topics and then perform experiments to supplement material learned

Resources: (Information for club provided by)

Self

Content Areas: (check all that apply)

- ☐ Arts (Visual, Music, Theater &Performance)
- ☐ Literacy
- ☒ STEM (Science, Technology, Engineering &Math)
- ☐ Social Studies
- ☐ Wellness (Physical Education, Health, Nutrition &Character Education)

Outputs or final products: (Does the club have a final product/project to showcase to community?)

Activity Booklets for DIY at-home projects

Introducing your Club/Activities:

Color dispersion, soil layers, elephant toothpaste, buoyancy tests, rock cycle, etc.

General Directions:

Perform experiments as indicated. Some minor changes can be made and the experiment will still have the same outcome.

Tips/Tricks:

Run experiments at home beforehand; make powerpoints (or ways to present information) engaging and appealing to young students

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Buoyancy test: whose boat can hold the most weight?
Length of Activity:	1 hour (including presentation of information)
Supplies:	Aluminum foil, container to hold water, small weighted items (pennies, marbles, etc.), ruler

Directions:

Cut out 8 inches by 8 inches (4x4 is also acceptable) aluminum foil squares and give one to each student. Have the students create foil boats using a design they think will hold the most weight. After the allotted building time is up, have students test boats, one at a time, by placing in water and adding weighted items in small increments until the boat sinks. Record results to declare a winner at the end.

Conclusion of the activity:

The kids enjoyed creating the boats and incorporating friendly competition keeps their interest levels piqued. The students understood density and buoyancy while having fun.

Parts of activity that worked:

The students were engaged in building and testing their boats. This activity was an overall success. Creating a small activity showing pictures of items and having them say whether the item would sink or float was an effective way to test if they were learning.

Parts of activity that did not work:

Some of the students' behavior was disruptive due to the competitive nature of the experiment.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Tricky Senses
Length of Activity:	1 hour (including presentation of materials)
Supplies:	2 liter bottle of Sprite or 7-Up, food coloring (3 different colors), plastic cups, 2 different multicolored candy (M&M, skittles, Sweetarts, etc.), Goldfish

Directions:

This activity is split into 2 parts: if two club leaders are present, split the class into two groups. **Part 1 – sight:** Start by pouring some Sprite for each student into the plastic cups. Each student will need as many cups as the number of drinks being tested. Add food coloring to Sprite to give appearance of other drinks. For example, add brown to give the appearance of Dr. Pepper; add green for Mountain Dew, yellow for Lemonade, etc. Have them test the regular Sprite for the last test. Have students guess what the drink is before and after tasting. **Part 2 – taste buds:** Have students close their eyes and give them the candy and crackers to eat and have them predict what they just ate. For the other candy, have students guess which color they ate while plugging up one of their other senses (plugging nose is easier than plugging both ears).

Conclusion of the activity:

This experiment was an overall success and students seemed to pay closer attention because of the food and drink involved. There were a couple students who have done a similar experiment before, so they were able to figure it out, however, almost all the first-time students were tricked.

Parts of activity that worked:

The students were able to follow directions while doing the sense tests as none of them wanted to go without candy and pop.

Parts of activity that did not work:

The discussion afterwards did not go smooth. A lot of the students were blurting out answers and were a little too hyped up after the experiment.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Playin' in the Dirt!
Length of Activity:	Roughly 1 hour (with explanations as food is handed out)
Supplies:	Plastic cups (preferably clear ones), gummy worms or other candied bug, crushed Oreos (or any other dark cookie), chocolate pudding, chocolate chips (dark or milk)

Directions:

In this activity, you are simulating soil with certain sugary foods (all foods listed can be substituted, this is just an example). The first step is to hand out the plastic cups, followed by placing a small layer of crushed Oreos in the cup to simulate the R horizon, or bedrock. Following this, another thin layer of chocolate chips is placed, simulating the C horizon. Next, the B horizon is simulated with a thicker layer of chocolate pudding. This layer should be about a third of the cup. Next, another layer of crushed Oreos to simulate the A horizon is added followed by the O horizon, which is the gummy worms.

Conclusion of the activity:

This activity was one of the best in terms of class reaction and participation. At the end of the experiment, the kids were able to connect the specific foods to the layers of soil and seemed to have actually learned a lot during the club session.

Parts of activity that worked:

This whole activity worked really well due to the junk food that went along with the activity. The students were very attentive throughout the lesson.

Parts of activity that did not work:

The kids were a little rowdy waiting for the moment they could eat. Consider going through everything before handing the food out, not talking as you hand out the food.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Volcanic Simulation
Length of Activity:	Roughly 30 minutes
Supplies:	A 2 liter of diet cola, 2-3 rolls of Mentos,

Directions:

This is a very simple experiment that only requires two ingredients and should be performed **OUTSIDE**. Start off with a 2 liter of diet cola and place on ground where nothing can push it over. Next, take a roll of Mentos and place them in a rolled-up piece of paper (this serves as a filter for the Mentos going into the can). Drop the Mentos into the can, run away and observe the fizzy explosion.

Conclusion of the activity:

The students LOVED this activity! Every one of them was very intrigued and couldn't wait to see the finished product. I would recommend this to every person who influences younger kids in some way; however, it is a little dangerous so make sure the kids are safe and in your line of sight at all times.

Parts of activity that worked:

The kids were attentive to the conceptual stuff about volcanoes and natural explosions. In addition, each student got to assist in some capacity during the experiment which made them all very happy.

Parts of activity that did not work:

The explosion of Mentos and coke wasn't as extreme as we were anticipating, probably due to allowing the students to put the Mentos into the pop. Some kids were also off task due to excitement, so we had to explain why it's important to pay attention quite often.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Rock Candy Galore
Length of Activity:	1 hour for activity, 1 day for rock candy
Supplies:	Food coloring, sugar, water, cup/jar. Paper towel/tissue

Directions:

First, wet the skewer and rub it all in the sugar; the skewer should be a little over half coated in sugar. Next, add 2 cups of water to pan and bring to a boil. Once the water is boiling, add 1 cup of sugar until it's fully dissolved in the water. Repeat two more times (total of 3 cups of sugar). When the last cup of sugar is dissolved, remove the pot and add food coloring; a few drops will be more than enough. Once the solution is cooled for 5-10 minutes, pour into a cup or mason jar. Place the jar/cup in a cool area with the skewer in it. Cover the top of the jar with a tissue or paper towel. Check the jar 24 hours later, and you will have rock candy!

Conclusion of the activity:

This activity didn't work as well as anticipated. The school did not allow us access to a stove which made boiling water impossible, therefore we tried to heat water up in microwave. The kids really enjoyed learning about igneous, metamorphic, and sedimentary rocks, however.

Parts of activity that worked:

The kids learned a lot about rocks and the rock cycle and even brought us rocks they found the following week, identifying which type they were in the process.

Parts of activity that did not work:

Basically, the whole rock candy formation process did not work. Sugar wasn't able to be dissolved in the water which threw the entire experiment off. The kids were really bummed so we brought in the rock candy we prepared outside of class the following week.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Elephant Toothpaste
Length of Activity:	Roughly 30 minutes
Supplies:	Hydrogen peroxide, dish soap, food coloring, plastic bottle or slim container, heated up water, dry yeast, measuring cups (1/2 cup, 1 tbs)

Directions:

Begin this experiment by pouring roughly ½ a cup of hydrogen peroxide (store bought) into the empty bottle or container. A bottle is more preferable as the narrower the exit, the more controlled the explosion is. Next, add a healthy glob of dish soap and mix. Next, add food coloring of choice to mixture. Mix and match food coloring to try and create a colorful explosion. In a separate mixture, add 3 tablespoons warm water with 1 tbs dry yeast. Stir this mixture before adding to the bottle. Immediately after combining the two mixtures, the reaction will happen so make sure you get out of the way.

Conclusion of the activity:

This activity was another crowd favorite. It worked really well, and the kids really enjoyed watching the explosion. I would recommend this experiment to everyone.

Parts of activity that worked:

This was a very inclusive activity where each student had a role to play in the final product. The steps are very kid friendly and can even second as a practice for measuring.

Parts of activity that did not work:

Like the cola and Mentos experiment, this experiment was more dangerous than the typical activity, so extra caution had to be taken to ensure the students' safety. We had to remind the kids frequently to back up from the bottle.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Slimy Slime
Length of Activity:	About 30 minutes
Supplies:	Spoon, mixing bowl, glass bowl, measuring utensils, food coloring, water, Elmer's glue, Borax powder

Directions:

Start by placing 1 cup of water into the small bowl/cup and stir in the Borax powder. In larger bowl, place ½ cup water and ½ cup glue and stir thoroughly. When this is mixed together, add food coloring of choice to create the preferred color of slime. Add the Borax solution from earlier into the colored solution and stir. A big lump will form (which is good), so continue to stir until the lump absorbs most of the liquid surrounding it. Pick up the mixture with hands; you have created slime!

Conclusion of the activity:

Every time I've done this experiment with kids, they've loved it. Slime is to young people as peanut butter is to jelly; it just works. The students were very engaged and asked great questions about why they were observing specific things throughout the activity.

Parts of activity that worked:

The overall procedure went really well, and the students were very attentive and not very disruptive. The kids loved mixing and matching food coloring to make crazy colored slime.

Parts of activity that did not work:

Some students tried to put their slime on others' stuff, therefore we were required to take the students' slime until the end of the club period.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Strawberry DNA
Length of Activity:	1 hour
Supplies:	Measuring devices, rubbing alcohol, salt, water, glass bowl, funnel, tall water glass, strawberries (mushy ones more preferable), zip-lock bags, small glass jar, toothpicks, thick paper towels, skewer

Directions:

This activity is very complex and requires a lot of materials but is very information for the kids very interested in science. Prior to starting the experiment, place the rubbing alcohol in the freezer. Start off by mixing ½ tsp salt in small bowl along with 1/3 c water and 1 tbs dish soap. Set this mixture aside. Take the funneling device and line it with the paper towel. Place funnel into the tall water glass (not the bowl that was just used). Place strawberries into plastic bags with the green stems removed. Seal bag and must the berries into a near-liquid state. Unseal the bag and add 3 tbs of mixture prepared at beginning (salt/soap) to berries and mixture for another minute. Pour the berry mixture into the funnel and allow it to drip through into the tall glass. Once filtered, place into small glass jar. Measure ½ cup rubbing alcohol and slowly pour down the side of jar. Let mixture settle (don't mix) and then take a skewer and swirl in mixture and lift up. You should pick up a clear, slimy substance; this is the DNA!

Conclusion of the activity:

This activity worked really well and was a perfect experiment to show a more complex part of the STEM field for students who were really interested. Being able to visualize DNA made a lot of students' mouth open and smile.

Parts of activity that worked:

All parts of this activity worked really well. The procedure was executed, the students were engaged and asking questions about the procedure, and the final product turned out better than expected.

Parts of activity that did not work:

This activity was very messy so if you're planning on keeping the workplace clean, take extra precaution.

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Colored Milk
Length of Activity:	30 minutes
Supplies:	Milk, dinner plate or bowl, food coloring, dish soap, cotton swabs

Directions:

First, pour enough milk to cover the bottom of bowl or plate. Next add 4 drops of food coloring total, using the color(s) of choice; it's fun to mix and match colors for this activity. Then grab a clean cotton swab and cover the cotton part with dish soap. Once covered, place the cotton swab anywhere in the milk and watch what happens. Re-dip cotton swab in soap and repeat experiment until milk turns a uniform color.

Conclusion of the activity:

This experiment is great way to visualize chemical reactions by adding food coloring to the mixture. It shows the concept of surface tension and how it breaks when dish soap is added to the milk.

Parts of activity that worked:

N/A

Parts of activity that did not work:

N/A

LESSON PLAN WORKSHEET

(copy table as needed)

Lesson Activity Name:	Ice Cream! in a bag?
Length of Activity:	30 minutes
Supplies:	Milk, heavy cream, vanilla extract, sugar, food coloring, ice, rock salt (normal salt works too), zip-lock bags: 1 quart-size and 1 gallon-size

Directions:

To start this experiment, place ½ cup milk, ½ cup heavy cream, ¼ tsp vanilla, a few drops of food coloring (optional), and 4 tsp sugar into the smaller of the two bags. Seal bag tightly. Put ½ cup of ice into the larger bag and sprinkle a handful of salt on top of the ice; place the smaller bag into the larger bag. Add more ice and salt on top until the larger bag is nearly full. Seal larger bag extremely tight, then, while holding both sides of the bag, shake for 5-10 minutes. After shaking, take the smaller bag out of the larger bag and rinse the salt from the smaller bag. Next, enjoy the homemade ice cream you just created!

Conclusion of the activity:

This is a very fun activity with a very fun end product. The experiment works with melting point and how certain additions (salt) allow the liquid to freeze at a lower temperature. It also demonstrates how salt is used in winter conditions, it draws the heat towards itself, allowing the ice it's scattered on to melt.

Parts of activity that worked:

N/A

Parts of activity that did not work:

N/A